

**Translation**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>040606</b>		<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416																								
International application No. <b>PCT/FR2004/001421</b>		International filing date (day/month/year) <b>09.06.2004</b>		Priority date (day/month/year) <b>12.06.2003</b>																								
International Patent Classification (IPC) or national classification and IPC																												
Applicant <b>LALLEMAND SAS</b>																												
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <b>9</b> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <table border="0"><tr><td><input checked="" type="checkbox"/></td><td>Box No. I</td><td>Basis of the report</td></tr><tr><td><input type="checkbox"/></td><td>Box No. II</td><td>Priority</td></tr><tr><td><input type="checkbox"/></td><td>Box No. III</td><td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td></tr><tr><td><input type="checkbox"/></td><td>Box No. IV</td><td>Lack of unity of invention</td></tr><tr><td><input checked="" type="checkbox"/></td><td>Box No. V</td><td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VI</td><td>Certain documents cited</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VII</td><td>Certain defects in the international application</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VIII</td><td>Certain observations on the international application</td></tr></table>					<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand			Date of completion of this report																									
Name and mailing address of the IPEA/EP			Authorized officer																									
Facsimile No.			Telephone No.																									

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/001421

Box No. I	Basis of the report
1.	<p>With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.</p> <p><input type="checkbox"/> This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:</p> <p><input type="checkbox"/> international search (Rule 12.3 and 23.1(b))</p> <p><input type="checkbox"/> publication of the international application (Rule 12.4)</p> <p><input type="checkbox"/> international preliminary examination (Rule 55.2 and/or 55.3)</p> <p>2. With regard to the elements of the international application, this report is based on <i>(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)</i>:</p> <p><input type="checkbox"/> the international application as originally filed/furnished</p> <p><input checked="" type="checkbox"/> the description:</p> <p>pages <u>1-22</u> _____ as originally filed/furnished</p> <p>pages* _____ received by this Authority on _____</p> <p>pages* _____ received by this Authority on _____</p> <p><input checked="" type="checkbox"/> the claims:</p> <p>nos. <u>1-17</u> _____ as originally filed/furnished</p> <p>nos.* _____ as amended (together with any statement) under Article 19</p> <p>nos.* _____ received by this Authority on _____</p> <p>nos.* _____ received by this Authority on _____</p> <p><input checked="" type="checkbox"/> the drawings:</p> <p>sheets <u>1/3-3/3</u> _____ as originally filed/furnished</p> <p>sheets* _____ received by this Authority on _____</p> <p>sheets* _____ received by this Authority on _____</p> <p><input type="checkbox"/> a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.</p> <p>3. <input type="checkbox"/> The amendments have resulted in the cancellation of:</p> <p><input type="checkbox"/> the description, pages _____</p> <p><input type="checkbox"/> the claims, nos. _____</p> <p><input type="checkbox"/> the drawings, sheets/figs _____</p> <p><input type="checkbox"/> the sequence listing (<i>specify</i>): _____</p> <p><input type="checkbox"/> any table(s) related to sequence listing (<i>specify</i>): _____</p> <p>4. <input type="checkbox"/> This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).</p> <p><input type="checkbox"/> the description, pages _____</p> <p><input type="checkbox"/> the claims, nos. _____</p> <p><input type="checkbox"/> the drawings, sheets/figs _____</p> <p><input type="checkbox"/> the sequence listing (<i>specify</i>): _____</p> <p><input type="checkbox"/> any table(s) related to sequence listing (<i>specify</i>): _____</p>

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/001421

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-16	YES
	Claims	17	NO
Inventive step (IS)	Claims	1-16	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-17	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
1. Reference is made to the following documents:			
<p>D1: CARBO R ET AL: "AISLAMIENTO Y SELECCION DE BACTERIAS LACTICAS EN VINO ISOLATION AND SELECTION OF LACTIC ACID BACTERIA IN WINE ISOLAMENTO E SELEZIONE DI BATTERI LATTICI NEL VINO" RIVISTA DI VITICOLTURA DI ENOLOGIA, SCARPIS, TREVISO, IT, vol. 48, no. 4, 1995, pages 29-38, XP009021609 ISSN: 0370-7865</p> <p>D2: CARRIE C ET AL: "COMPARISON OF COMMERCIAL PREPARATIONS OF LACTIC ACID BACTERIA FOR DIRECT INOCULATION, FOR CONTROL OF MALOLACTIC FERMENTATION OF MERLOT WINES COMPARISON DE PREPARATIONS COMMERCIALES DE BACTERIES LACTIQUES A ENSEMENCEMENT DIRECT, EN VUE DE GERER LA FERMENTATION MALOLACTIQUE DU MERLOT" REVUE DES OENOLOGUES ET DES TECHNIQUES VITIVINICOLES ET OENOLOGIQUES, UNION NATIONALE DES OENOLOGUES FRANCE BOURGOGNE-PUBLICATIONS,, FR, no. 103, 2002, pages 16-18, XP009023946 ISSN: 0760-9868</p> <p>D3: PILONE G J: "A NEW ZEALAND EXPERIENCE IN DIRECT-VAT INOCULATION FOR MALOLACTIC</p>			

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/001421

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

FERMENTATION" AUSTRALIAN AND NEW ZEALAND WINE  
INDUSTRY JOURNAL, AUSTRALIAN INDUSTRIAL  
PUBLISHERS, ADELAIDE, AU, vol. 10, no. 2, May  
1995 (1995-05), pages 169-173, XP009023865  
ISSN: 0819-2421

D4: LIU S-Q ET AL: "GROWTH AND METABOLISM OF  
SELECTED LACTIC ACID BACTERIA IN SYNTHETIC  
WINE" AMERICAN JOURNAL OF ENOLOGY AND  
VITICULTURE, XX, XX, vol. 46, no. 2, 1995,  
pages 166-174, XP009021611 ISSN: 0002-9254

D5: JOYEUX A ET AL: "COMPARAISON DE DIVERSES  
PREPARATIONS INDUSTRIELLES DE BACTERIES  
LACTIQUES REACTIVEES POUR STIMULER LA  
FERMENTATION MALOLACTIQUE COMPARISON OF  
VARIOUS REACTIVATED INDUSTRIAL PREPARATIONS  
OF LACTIC ACID BACTERIA FOR STIMULATION OF  
MALOLACTIC FERMENTATION" CONNAISSANCE DE LA  
VIGNE ET DU VIN, VIGNE ET VIN PUBLICATIONS  
INTERNATIONALES, BORDEAUX, FR, vol. 19, no.  
3, 1985, pages 149-159, XP009023986 ISSN:  
0010-597X

D6: FUSTER A ET AL: "Improvement of the quality  
and typicalness of wines with the aid of new  
biological techniques." REVUE FRANCAISE  
D'OENOLOGIE, LALLEMAND SA, 130 ROUTE  
D'ESPAGNE, BP 1021, 31023 TOULOUSE, FRANCE,  
2002, pages 28-31, XP009027063

D7: EDWARDS C G ET AL: "OCCURRENCE AND  
CHARACTERIZATION OF LACTIC ACID BACTERIA FROM  
WASHINGTON STATE WINES: PEDIOCOCCUS SPP"  
AMERICAN JOURNAL OF ENOLOGY AND VITICULTURE,  
XX, XX, vol. 43, no. 3, 1992, pages 233-238,

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/001421

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

XP009021610 ISSN: 0002-9254

D8: WO 93/20180 A (HANSENS LAB; PRAHL CLAUS (DK);  
NIELSEN JAN CLAIR (DK)) 14 October 1993  
(1993-10-14)

D9: LIU S Q: "Malolactic fermentation in wine -  
beyond deacidification." JOURNAL OF APPLIED  
MICROBIOLOGY 92 (4) 589-601, NEW ZEALAND  
DAIRY RES. INST., PALMERSTON NORTH, NEW  
ZEALAND. E-MAIL SHAO.LIU(A)NZDRI.ORG.NZ,  
2002, XP002272274

(see the corresponding passages cited in the  
search report)

- 1.2 The present application fails to comply with the  
requirements of PCT Article 33(1) since the  
subject matter of claim 17 does not meet the  
requirement of novelty defined in PCT Article  
33(2). The subject matter of claims 1 to 16 does  
comply with the requirement of novelty defined in  
PCT Article 33(2).

The present application relates to a strain of  
lactic acid bacteria that can perform malolactic  
fermentation when it is added directly in a dried,  
freeze-dried or frozen state (claims 1 to 8), a  
preparation of such lactic acid bacteria (claim  
9), methods for converting malic acid (claims 10  
to 16) and a mature wine (claim 17).

D1 describes malolactic fermentation using strains  
of lactic acid bacteria *L. plantarum* and *L. brevis*

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/001421

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

in a wine having an alcohol content of 10 % and a pH no lower than 3.5 (page 31; 33 to 35; and page 37). D1 also describes how the lactic acid bacteria strains are *Pediococcus*, *Leuconostoc* and *Lactobacillus* (page 30). The strains quickly break down malic acid (figure 5) following a period of cell culture acclimation (page 34). D1 does not specify whether the strains are suitable for malolactic fermentation following direct inoculation in a dried, freeze-dried or frozen state.

D2 and D3 describe direct inoculations with lactic acid bacteria strains in a dried, freeze-dried or frozen state in malolactic fermentation. The bacterial strains used are not specified (D2) or they do not ferment under the conditions claimed (D3).

D4 describes malolactic fermentation using strains of lactic acid bacteria *L. plantarum* and *L. parvulus* in a wine having an alcohol content of 10 % and a pH no lower than 3.5 (tables 1 to 3). The *Lactobacillus* and *Pediococcus* species are inoculated in a wine after incubation periods of 7 to 10 days. Direct addition to the wine is not described. D4 does not specify whether the strains are suitable for malolactic fermentation following direct inoculation in a dried, freeze-dried or frozen state.

D5 describes malolactic fermentation using *L.*

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/001421

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

*hilgardii* (table I, table IV, white wine). The strain is used after suitable reactivation (page 1). D5 does not specify whether the strains are suitable for malolactic fermentation following direct inoculation in a dried, freeze-dried or frozen state.

Claim 1 is considered to be a claim relating to a composition for a particular use: "capable of performing conversion of malic acid into lactic acid ... when added in a dried, freeze-dried or frozen state".

When a known material which is in principle identical to the composition defined in the claim is indeed suitable for the use indicated, even though it was not specifically described as being suitable for such a use, then the claim is no longer novel. Prior art documents D1, D4 and D5 all describe strains having similar properties. However, these strains are used after reactivation and not directly in a dried, freeze-dried or frozen state. These documents do not specify whether said strains are suitable for direct inoculation. It follows that the subject matter of claims 1 to 16 is novel over the prior art cited.

The subject matter of claim 17 is defined in terms of the method for making same. No such claim is acceptable unless the material itself complies with the requirements of patentability. A material does not become novel merely because it is

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/001421

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

obtained by means of a novel production method.  
The method must involve technical features that enable the material to be differentiated from prior art materials. No difference between the wines of D1 and D5 and the wine according to claim 17 can currently be determined.

3. The present application complies with the requirements of PCT Article 33(1) since the subject matter of claims 1 to 16 involves an inventive step as defined in PCT Article 33(3).

The problem solved by the invention is that of controlling the progress of malolactic fermentation in a medium that already contains alcohol and has a medium to high pH. The solution lies in alcohol-resistant strains of lactic acid bacteria belonging to species *Lactobacillus* and *Pediococcus*, which can initiate and carry out complete malolactic fermentation when added in a dried, frozen or freeze-dried state.

D1, D4 and D5 differ from the subject matter of the present application in that the strains of species *Lactobacillus* and *Pediococcus* are not used directly in a dried, frozen or freeze-dried state, and are instead used after reactivation.  
For practical reasons, a person skilled in the art would be aware of, and seek to use, direct-inoculation starter cultures (see, for example, D2 and D3: "frozen and freeze-dried commercial MLF starter cultures"). D3 discloses a starter culture

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FR2004/001421

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
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containing *Leuconostoc oenos* bacteria. *Leuconostoc oenos* is considered to be the most suitable bacterium and is the one most widely used for the malolactic fermentation of wine (see D2, D3, D6, D8).

In the opinion of the Examining Authority, the direct inoculation of wines with bacteria requires the bacteria to have very specific properties so that malolactic fermentation can be initiated very quickly. Even if a person skilled in the art were to use the bacteria of D1, D4 or D5 in a direct starter culture, he or she would not be guaranteed to arrive at the solution claimed.

4. The subject matter of claims 1 to 17 complies with the requirements of PCT Article 33(4).

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